

## Ir/Pt-HZSM5 for n-pentane isomerization: effect of iridium loading on the properties and catalytic activity

### Abstract :

The effects of iridium loading on the properties of Ir/Pt-HZSM5 and n-pentane isomerization were studied. XRD, IR, and NMR results indicated that increasing iridium loading did not much change the properties of catalysts, but eliminated the perturbed silanol groups at 3700 and 3520 cm<sup>-1</sup>, whereas IR and ESR spectroscopy confirmed that increasing iridium loading continuously decreased the permanent Lewis and Brønsted acid sites and inhibited the formation of protonic acid sites induced by hydrogen. At low iridium loading (0–0.3 wt%), cracking process proceed through dimerization-cracking step, whereas high iridium loading (0.5–2.0 wt%) reduces the contribution of dimerization-cracking step and promotes the contribution of hydrogenolysis. The excessive amount of iridium loading, with the presence of a low amount of active protonic acid sites and hydrogen gas, accelerated the hydrogenolysis process. The activity of Ir/Pt-HZSM5 was marginal in the absence of hydrogen, showing the dependence of activity on promotive effect of hydrogen.